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This study considered the predictive power of the General Aptitude Test Battery (GATB) for the junior college student, for whom the traditional measures of ability may not be suitable. It was designed to see if the GATB would predict GPA for first-semester freshmen in transfer and in vocational programs. Three hypotheses were tested on 203 transfer and 88 vocational-technical students. Details of the sampling and data analysis are given. Two pertinent findings were: (1) certain aptitudes from the complete battery are fair predictors of academic success for freshmen entering a transfer program; (2) they are less successful predictors for the entering vocational-technical students. One implication is that, when two aptitudes are combined for the transfer student, a respectable predictive validity results. It is a useful counseling tool, especially as it takes less than 15 minutes to administer both subtests. Others should duplicate this research to find predictive validities of special use to their own colleges. Validities for the vocational-technical student were low; using an overall category to predict GPA's would not contribute to the accuracy of prediction for either group. Further research is needed for the technical student to isolate the more homogeneous career fields if the GATB is to be helpful to him. (HH)

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THE GENERAL APTITUDE TEST BATTERY AS A PREDICTOR OF JUNIOR COLLEGE ACHIEVEMENT

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The General Aptitude Test Battery (GATB) has been in use now for 20 years in occupational and vocational counseling. During this time period validated occupational aptitude pattern norms have been developed and are now in use covering about 850 occupations. In addition, studies have been undertaken which indicate that the GATB does have some predictive power in assessing college achievement.

Jex and Sorenson (1953) in a study designed to discover the relationship between GATB scores and general college success concluded that the GATB as used in the study possessed sizable reliability. They also concluded that the test shows considerable promise as a quick, easily obtained predictor of college success. Sharp and Pickett (1959) in a similar study concluded that certain aptitudes from the test are fair predictors of college success and that there is no advantage in using grade point averages (GPA) from selected courses in a chosen field over the total cumulative GPA.

Droege (1968) in a Longitudinal Validation Study sited the following tentative conclusions:

1. "Validity for males is about as good as validity for females. [P. 46]."
2. There is little difference in the pattern of aptitude validity for institutions requiring two or three years of study and those requiring four or five years of study.

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3. Intelligence (G-scale), Verbal Aptitude (V-scale), Numerical Aptitude (N-scale), and Clerical Perception (Q-scale) had validities high enough to be considered useful.

In his findings he stated that, "there is enough variation from one college to another to conclude that local validation is important [P. 46]."

The conception behind this study is to consider the predictive power of the GATB when dealing specifically with the junior college student. Cross (1968) points out that in terms of ability the junior college students are significantly different from the high school graduates who enter four-year colleges. Junior colleges draw their students from the top, middle and bottom thirds of high school graduates, whereas, the students entering four-year schools tend to cluster in the top third. This then would seem to indicate we are dealing with a new kind of student, or as Cross (1968) states, "one for whom the traditional measures of ability may not be appropriate [P. 13]."

The purpose of this study is to determine if the GATB can predict with a significant validity the grade point averages of first semester freshmen at Manatee Junior College (MJC), Bradenton, Florida. This study is designed to answer the following questions: 1. Will the GATB predict GPA's for first semester freshmen at MJC who are enrolled in transfer programs. 2. Will the GATB predict GPA's for first semester freshmen at MJC who are enrolled in vocational-technical programs.

Hypotheses

Ho: The main hypothesis is that there is no correlation between first semester GPA's of freshmen at MJC and their scores on the nine scales of

the GATB.

Ha: There is a positive correlation between first semester GPA's of freshmen at MJC and their scores of the nine scales of the GATB.

Ho_1: There is no correlation between first semester GPA's of freshmen enrolled in transfer programs at MJC and their scores on the nine scales of the GATB.

Ha_1: There is a positive correlation between the first semester GPA's of freshmen enrolled in transfer programs at MJC and their scores on the nine scales of the GATB.

Ho_2: There is no correlation between first semester GPA's of freshmen enrolled in vocational-technical programs at MJC and their scores on the nine scales of the GATB.

Ha_2: There is a positive correlation between the first semester GPA's of freshmen enrolled in vocational-technical programs at MJC and their scores on the nine scales of the GATB.

Instrumentation and Design

All nine scales of the GATB, the independent variables, (G - Intelligence, V - Verbal Aptitude, N - Numerical Aptitude, S - Spatial Relationships, P - Form Perception, Q - Clerical Perception, K - Motor Coordination, F - Finger Dexterity, M - Manual Dexterity), were used in this study. Validity was defined as the coefficients of correlation between each of the GATB scales and the first semester GPA of a group of freshmen at MJC. The GPA's, the dependent variables, were computed by assigning four honor points for each semester hour of A, three honor points for each semester hour of B, and etc. Each of the nine scales of the GATB were correlated with the GPA's for all students in the sample

and for each of the sub-samples (those in transfer programs and those in vocational-technical programs).

The study was limited to first-time-in-college freshmen. Freshmen who completed less than 12 semester hours of college work were not retained in the sample. Students in the sample were identified as transfer or vocational-technical.

Sampling and Data Analysis

The students included in the sampling were those who had made application to MJC by May 21, 1967, of their senior year in high school and accepted an invitation from the college to participate in an early orientation and testing program immediately after graduation. Orientation is required of all students; those not attending the early program would attend one prior to registration. Potential subjects were eliminated for part-time enrollment, enrollment for non-credit basic studies program, and withdrawal before completion of the semester. A group of 291 students who completed a semester's course work became subjects of this study. The sample consisted of 203 students in the transfer programs and 88 students in the vocational-technical programs.

In June 1967 the GATB B-1002 was administered and scored on adult norms. The students who took the GATB and completed the first semester in January 1968 were matched and those who did not meet the criteria of the study were eliminated.

The Pearson Product-Moment correlation formula was used to correlate the data. Single tailed t tests for significance at the .01 level for correlation coefficients were applied to the results.

Results and Interpretation

The means, standard deviation, and correlation coefficients here after known as validity coefficients are shown in Table 1. In all but six instances the null hypothesis was rejected and the alternate accepted. When comparing the students in the transfer program with those in the vocational-technical program the highest significant validity coefficients obtained were in each case in the transfer group.

Insert Table 1 about here

The G, V, N, and Q aptitude scales for the transfer group have validities high enough to be useful in counseling junior college freshmen. This result is consistant with the study by Droege (1968). In using multiple regression to determine the combination of the two best predictors of academic success the V and Q aptitude scales yielded a multiple R of 0.529. These two aptitude scales possessed the least amount of intercorrelation as depicted in Table 2 for having individual validities as high as they did. The beta weights for this composite are 0.3534 for the V factor and 0.2854 for the Q factor. To develop a prediction equation the beta weights were transformed to b coefficients with the result of the following equation for predicting a GPA:

$$Y = (0.0226)X_1 + (0.0163)X_2 - 2.23 \qquad [1]$$

where X_1 is the V aptitude score and X_2 is the Q aptitude score. By imploying the standard error of estimate which is equal to 0.74 to the equation it is possible to predict accurately a range for the

GPA two-thirds of the time.

Insert Table 2 about here

Four of the six cases where the null hypothesis was accepted were in the vocational-technical subsample. The investigator believed that significant validities would be obtained for these aptitudes (S, K, F, and M) since they are skills and abilities which are heavily utilized in many vocational and technical career fields. The remainder of the aptitude validity coefficients from this subsample, even though significant, are considered to be to low for predictive purposes. The largest multiple R was derived by combining the G and Q aptitude scales with a result of 0.398. Students in this subsample were studying Engineering Technology, Drafting, Data Processing, Computer Programing, General Business, Secretarial Science, and Nursing. Conceivably the lumping together of all vocational-technical students into one category had a cancellation effect on some of the aptitude patterns. Not all career fields respond equally to all of the aptitudes (U.S. Department of Labor, 1967).

The vocational-technical students had aptitude mean scores which in most instances were lower than the transfer students, indicating a difference of abilities in favor of the transfer students. The dispersion of their GPA's was also smaller (0.77 as compared to 0.87 for the transfer students). This suggests that the vocational-technical students were more homogeneous in ability.

The total sample, although boasting significant validities

approaching a usable size, was not further analyzed for two reasons. 1. Over two-thirds of the data comes from the transfer student subsample. 2. The validities for the vocational-technical student subsample were low and therefore using an over-all category to predict GPA's would not be contributing to the accuracy of prediction for either group.

Findings and Implications

The following findings seem pertinent: 1. Certain aptitudes from the complete battery of the GATB are fair predictors of academic success for entering M.J.C. freshmen who enroll in a transfer program. 2. It is rather difficult to predict academic success for the vocational-technical student at M.J.C. using the GATB.

An implication from this study is that when certain GATB aptitudes are combined, in this case the V and Q for the transfer student subsample, a rather respectable and remarkable predictive validity results for use as a counseling tool. Remarkable in that the total time for administering these two subtests of the battery consumes less than 15 minutes. In generalizing from this study it should be remembered that it dealt specifically with a self-selected sample at a public, open door junior college. However, the duplication of this research at another institution is recommended for the purpose of arriving at usable predictive validities germane to that institution.

Concerning the vocational and technically oriented students, further research is needed which would isolate the more homogeneous career fields if the GATB is to be helpful with this type of student.

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Table 1

Means (M), Standard Deviations (σ), and Validity Coefficients (r) of the GATB, B - 1002, aptitude scores of Manatee Junior College First-Semester Freshmen

Aptitude	N = 207 Transfer Program Students			N = 88 Voc.-Tech. Program Students			N = 291 All Students - Total		
	M	σ	r	M	σ	r	M	σ	r
G - Intelligence	117.17	12.90	.45*	112.74	11.75	.28*	115.83	12.70	.40*
V - Verbal Aptitude	112.64	13.72	.46*	108.89	11.61	.27*	111.50	13.21	.41*
N - Numerical Aptitude	115.16	14.23	.38*	111.42	12.25	.30*	114.03	13.75	.35*
S - Spatial Aptitude	115.15	18.61	.17*	112.49	17.59	.19	114.32	18.31	.17*
P - Form Perception	118.38	18.68	.23*	119.86	19.66	.27*	118.83	18.96	.24*
Q - Clerical Perception	119.32	15.30	.41*	119.80	13.96	.35*	119.46	14.89	.40*
K - Motor Coordination	112.35	16.98	.21*	112.67	15.73	.01	112.45	16.59	.16*
F - Finger Dexterity	100.88	20.23	.16*	103.19	22.13	.13	101.58	20.82	.15*
M - Manual Dexterity	101.80	20.19	-.04	104.38	19.84	-.05	102.58	20.08	-.04

* $p < .01$

Table 2

GATB Aptitude Intercorrelations For Transfer Students (Upper right)
and
Vocational Technical Students (Lower left)

	G	V	N	S	P	Q	K	F	M
G - Intelligence		.74	.69	.53	.44	.45	.21	.08	.14
V - Verbal Aptitude	.73		.44	.18	.29	.36	.26	.09	.09
N - Numerical Aptitude	.69	.42		.05	.36	.54	.35	.06	.00
S - Spatial Aptitude	.57	.20	.10		.42	.12	-.10	.12	.18
P - Form Perception	.44	.31	.34	.41		.54	.24	.22	.22
Q - Clerical Perception	.41	.36	.52	.11	.54		.42	.08	.08
K - Motor Coordination	.13	.19	.30	-.14	.24	.37		.09	.16
F - Finger Dexterity	.10	.09	.06	.12	.27	.11	.12		.32
M - Manual Dexterity	.13	.03	.02	.18	.20	.04	.20	.33	